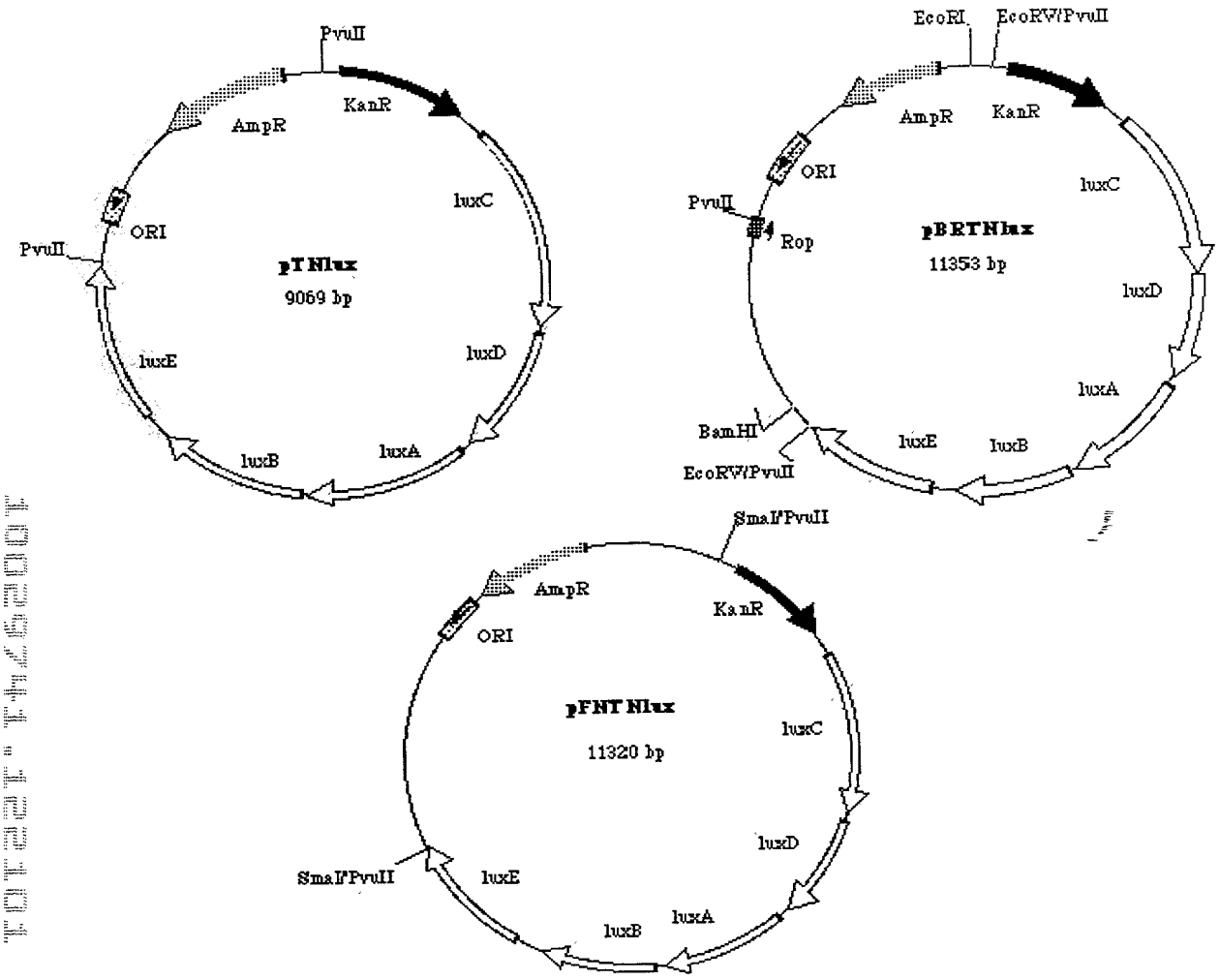

Figure 1. Plasmids used for the development of bacterial tester strains for embodiments of the bioluminescent "Ames" assays of the present invention. The plasmid pTN*lux* is a high copy vector based on pUC19 backbone. It was used as a source of the *lux(CDABE)* expression cassette (PvuII fragment). The plasmid pBRTN*lux* is a medium copy plasmid based on pBR322 backbone. The plasmid pFNTNlux is a low copy vector based on pFN476 backbone. AmpR, β-lactamase (ampicillin resistance); KanR, kanamycin resistance gene; ORI, origin of replication; Rop, rop gene. SmaI/PvuII and EcoRV/PvuII indicate ligation of PvuII end into SmaI or EcoRI site, respectively.

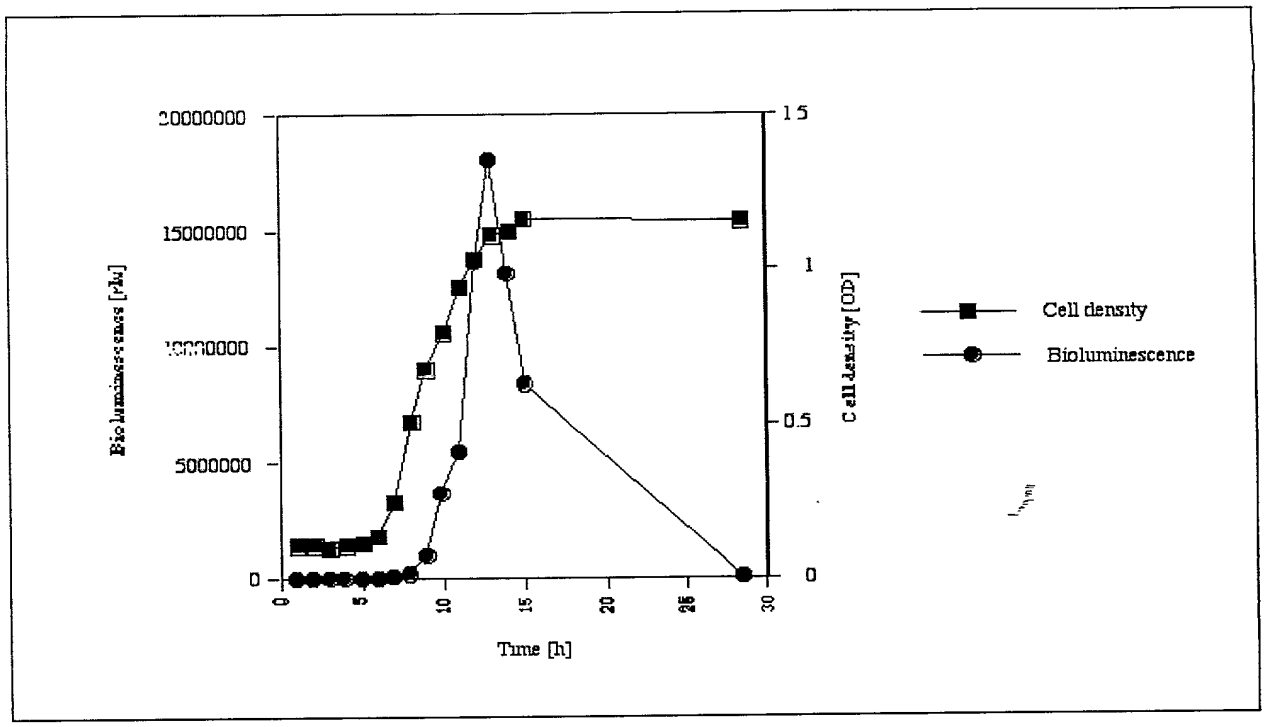

Figure 2. Levels of bioluminescence emitted by bacteria, prepared according to the present invention, during growth phases of bacterial culture. The values shown represent the average of three independent determinations.

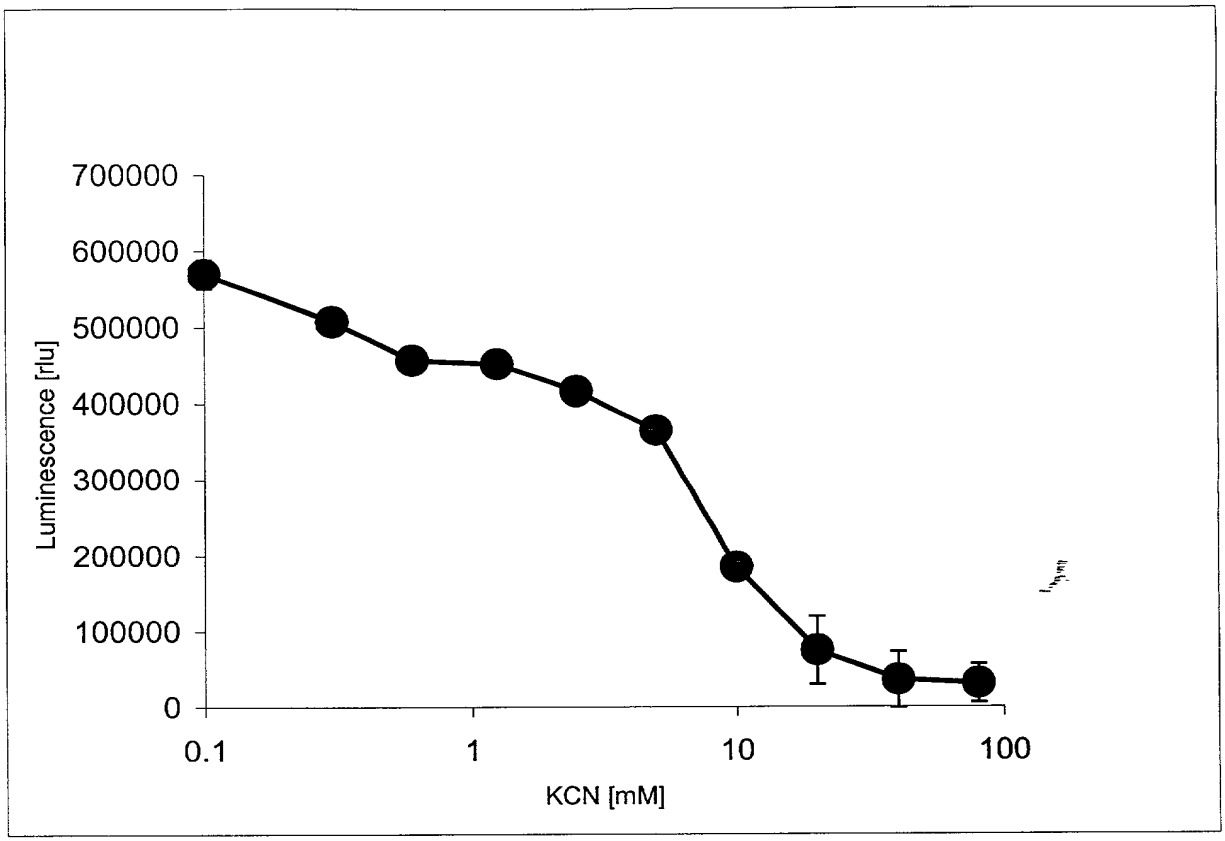

Figure 3. Influence of KCN on bioluminescence. The cells, prepared as provided by the present invention, were exposed to increasing concentrations of KCN. The bioluminescence was measured immediately after the addition of KCN. The values represent averages ± SD.

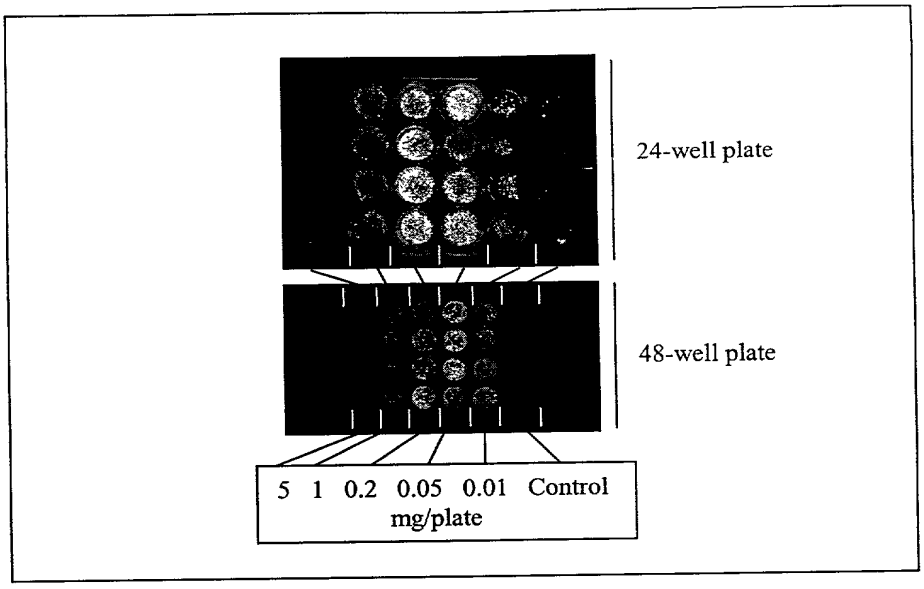

Figure 4. Bioluminescent detection of revertants of the present invention after treatment with the model mutagen MNNG. Images of bioluminescent microcolonies of revertants prepared according to the assays of the present invention. Results of assays, in quadruplicate, are shown; the concentrations of MNNG (mg/plate) reflect the standard (pour plate) Ames Assay.

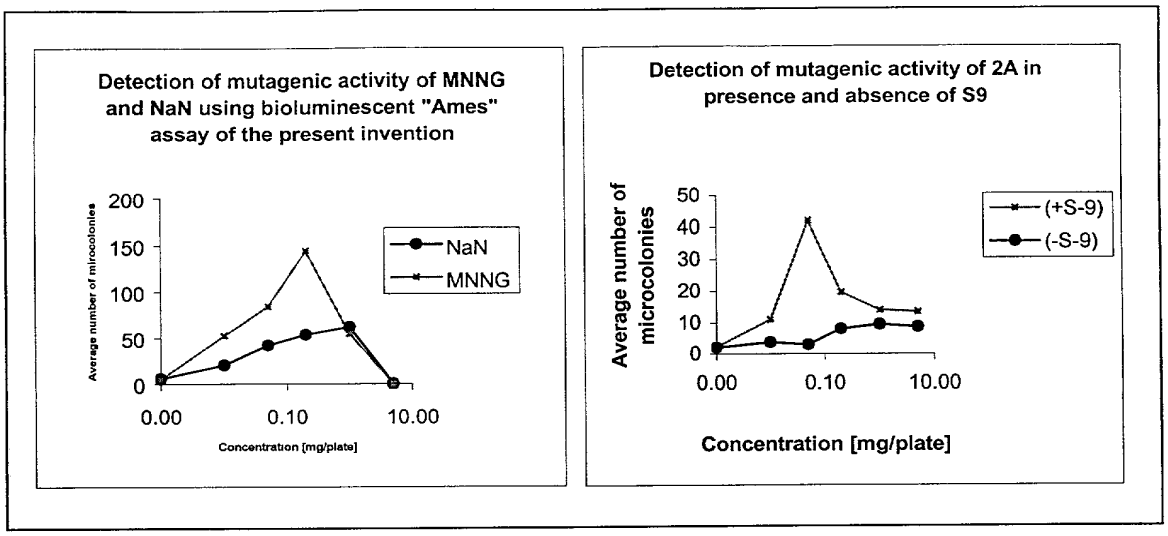

Figure 5. Detection of model mutagens using bioluminescent "Ames" assays of the present invention. The values represent an average number of revertant microcolonies from quadruple determinations.

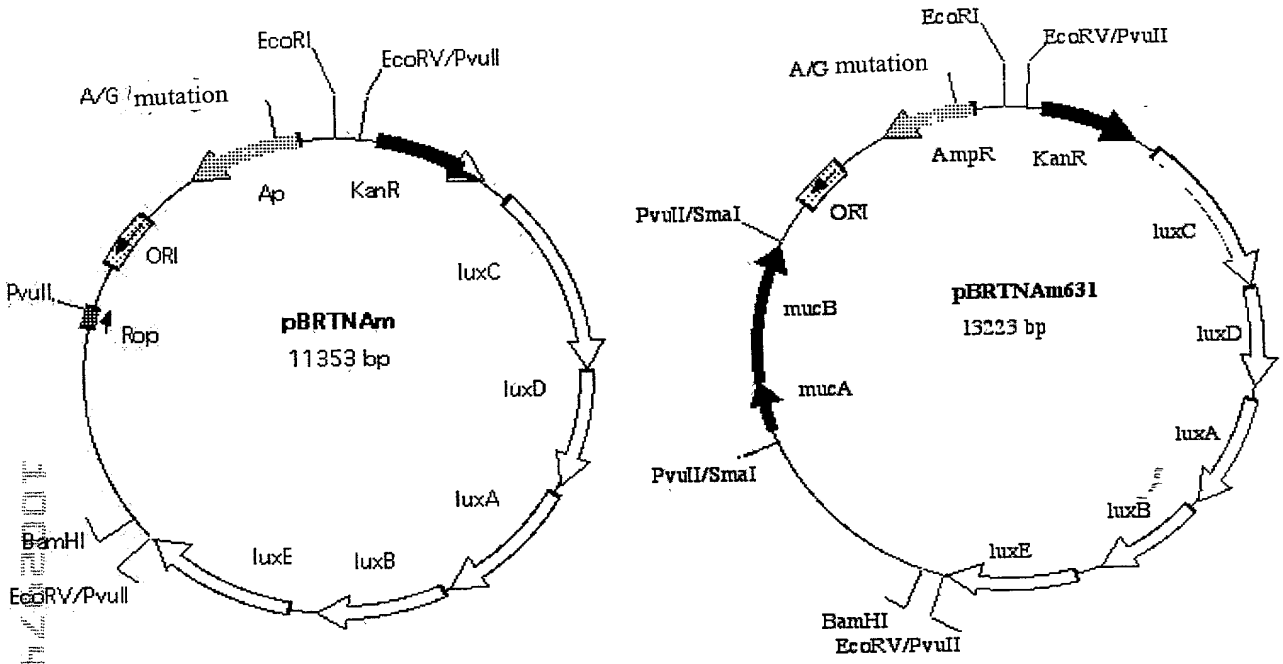

Figure 6. Plasmids used for the development of bacterial tester strains for embodiments of the bioluminescent β-lactamase assays of the present invention. Plasmid pBRTNAm and pBRTNAm631are based on pBR322 backbone. AmpR, β-lactamase (ampicillin resistance); KanR, kanamycin resistance gene; ORI, origin of replication; PvuII/SmaI and EcoRV/PvuII indicate ligation blunt ended DNA fragments that cannot be recleaved.

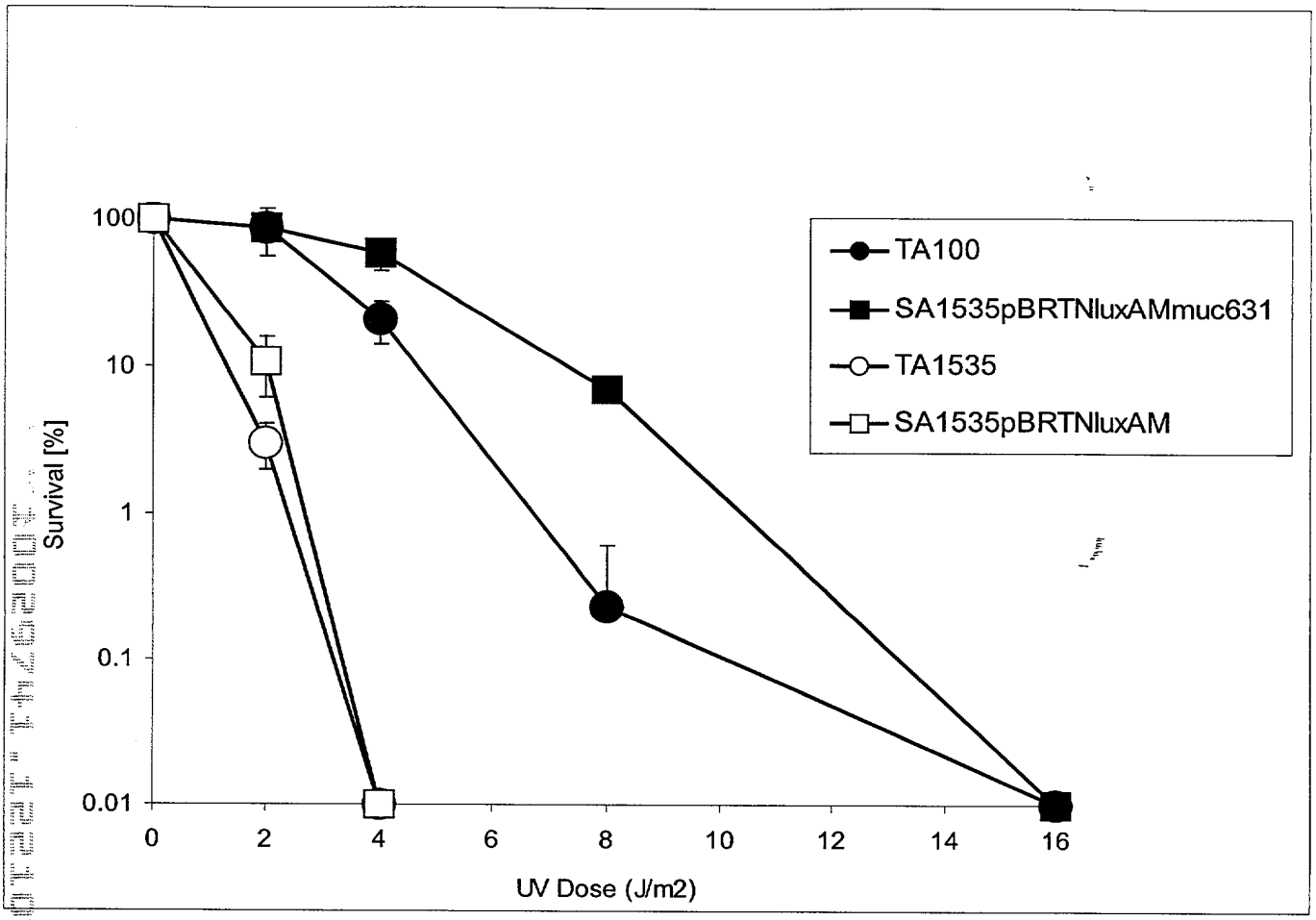

Figure 7. Influence of mucAB expression on UV sensitivity of *Salmonella typhimurium*. Bacterial cells, prepared according to the present invention, were exposed to increasing levels of UV light. The surviving cells were detected after incubation on LB plates. The values represent averages ± SD.

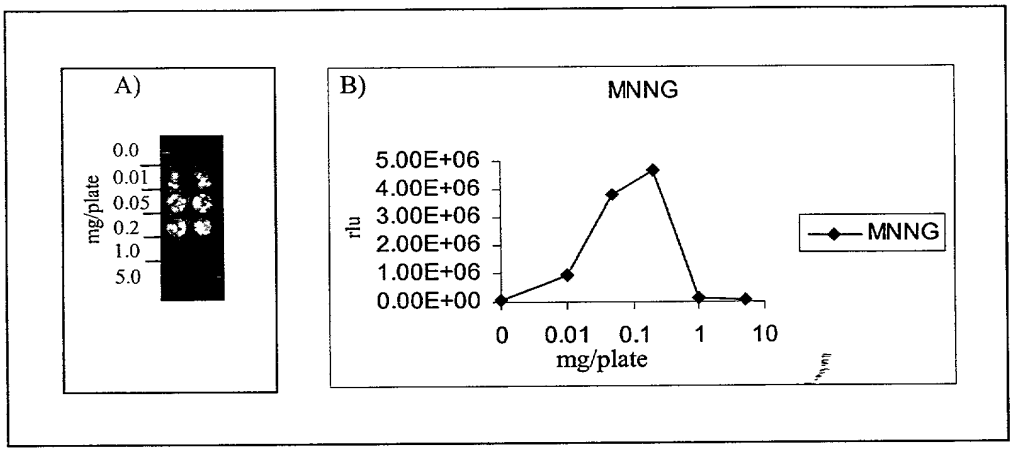

Figure 8. Detection of mutagenic activity of a known mutagen MNNG using an embodiment of the bioluminescent β-lactamase assays of the present invention. The assay was performed, as provided by the present invention, in 96 well plates, and the bioluminescence emitted was measured using a photon-counting camera. A) Image of treated wells; B) dose-response curve; the concentrations of MNNG (mg/plate) reflect the standard (pour plate) Ames Assay.